Washington State Department of Transportation

Memorandum

August 14, 2006

TO: Dawn Yankauskas/Marina Arakelyan
Project Office, NB82-77

FROM: Jim Cuthbertson/Pete Palmerson
E&EP Geotechnical Division, 47365

SUBJECT: SR-20, MP 54.74 to 56.85, OL-3485
Fredonia to I-5 Widening Phase 1
Test Pit & Piezometer Instrumentation

This memorandum presents the results of our supplemental geotechnical investigation for Phase 1 of the SR-20 Fredonia to I-5 Widening project. A vicinity map illustrating the project location near Fredonia in Skagit County, Washington is presented on Figure 1.

In accordance with your request, our office performed a supplemental subsurface investigation at the location of the Pier 1 abutment for the proposed new bridge #20/214 South. The purpose of the additional work was to verify the existence and determine the extent of debris and logs encountered during drilling.

On July 13th, 2006, a representative from our office logged a test pit excavated at the location shown on Figure 2. The test pit was excavated by the Mt. Vernon Maintenance crew using a Caterpillar 315C Hydraulic Excavator with a three foot wide bucket. Representatives from the Mt. Vernon Project Office were also present. A test pit log has been included as an attachment.

In general, the test pit indicated that the top 10 feet of material at the Pier 1 location is fill. The fill consists of well rounded silty coarse gravel with some debris such as asphalt and wood chunks. Within the fill is a well defined, inclined asphalt layer and a ~2-inch diameter electrical conduit (empty). At a depth of approximately 10 feet, a moist, blue-gray, low plasticity silt was encountered. Within the silt layer 1 log, approximately 2 feet in diameter was encountered and the excavator was able to break through. Another obstruction, possibly a log, was also encountered at the end of the test pit. The excavation operation was terminated when the operator was unable to break through the obstruction. The groundwater was encountered approximately 10 feet below grade.

In addition to the test pit, our office installed an In-Situ, Inc. MiniTROLL® water level datalogger in BH-03-05. The datalogger was set to record the water level hourly from June 28th, 2006 to July 25th, 2006. The purpose of installation was to verify the groundwater level fluctuation with the tidal fluctuation and determine the magnitude of the fluctuation. Since the proposed new structures on this project will be supported on drilled shafts constructed with slurry, groundwater fluctuation is a concern.

The plot of tidal activity in Padilla Bay to the north of the site versus the groundwater levels within the project show a definite correlation. While the groundwater at the site is definitely connected to tidal fluctuation, the magnitude of the fluctuation in the groundwater was less than 0.5 feet. Fluctuations of this magnitude should not be a serious concern during construction.

If you have questions or require further information, please contact Jim Cuthbertson at (360) 709-5451 or Pete Palmerson at (360) 709-5418.

Prepared By: Pete Palmerson
Geotechnical Engineer

8/15/06

EXPIRES 1/27/08

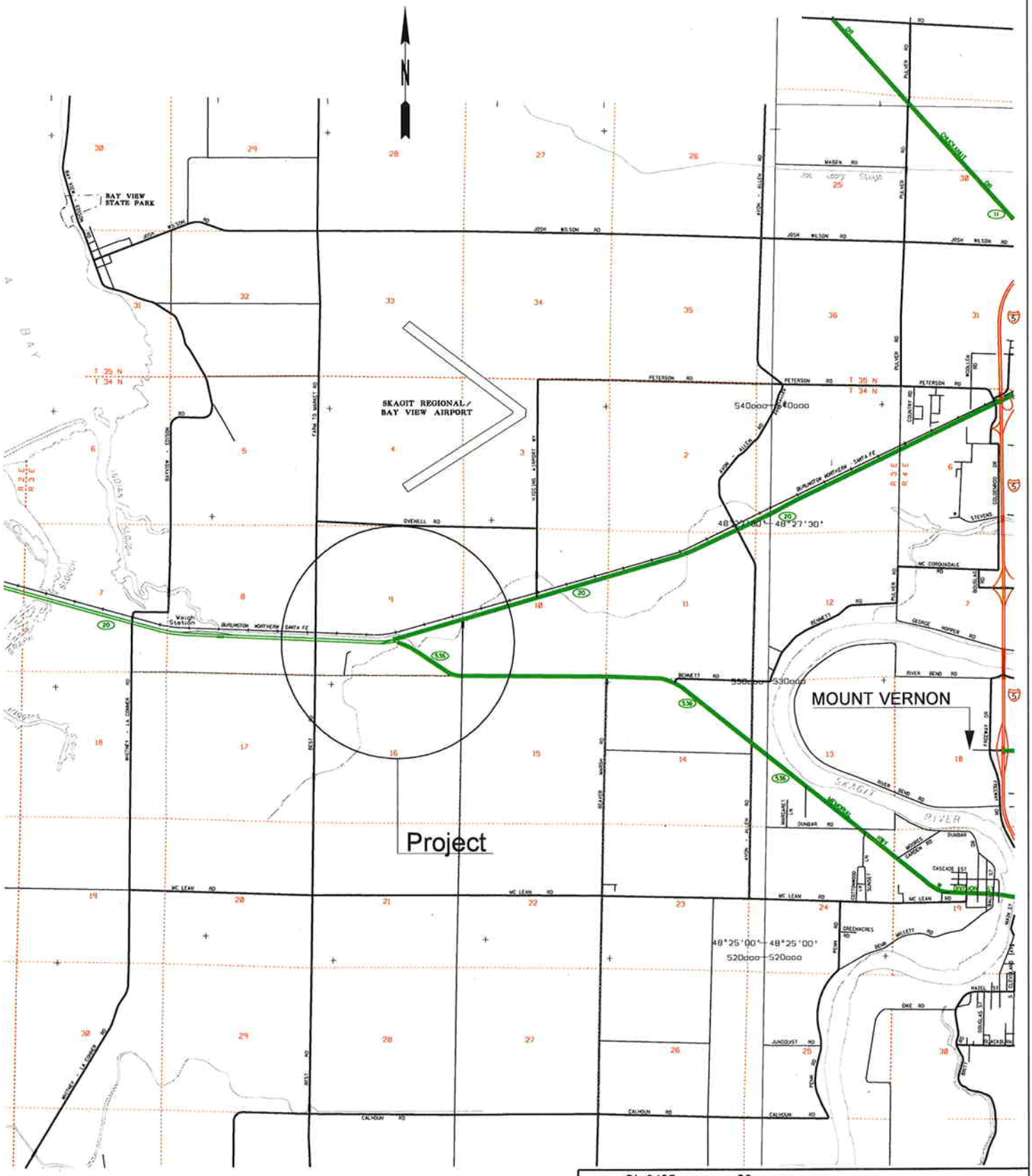
Reviewed By: Jim Cuthbertson
Chief Foundation Engineer

8/15/06

EXPIRES 03-13-08

JGC/pjp
Attachments:

cc: D. Stoddard, 47340
M. Sheikhizadeh, 47354
D. Crisman, NB82-54



JOB OL-3485 S.R. 20

SR 20 Fredonia to I-5 Phase 1

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL DIVISION

DATE 5/2006

SCALE N.T.S. VERT. HORIZ.

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Figure 1: Vicinity Map

Washington State
Department of Transportation

TEST PIT LOG

Location	Surface Elevation	Test Pit Number
Higgins Slough Bridge #20/214S	~12ft	TP-1-06

Project Name	Project Number
SR 20 Fredonia to I-5	OL-3485

Equipment	Date Started	Date Completed
Cat 315C Hydraulic Excavator	7/13/06	7/13/06

Elev / Depth	Desciption	Remarks
1	Section A-A'	3ft Bucket
1	Light gray, silty GRAVEL, coarse, dry with asphalt chunks to 8" and some wood.	
2		
3		
4		
5	4" layer of ASPHALT CONCRETE	
5	O ← 2" conduit (empty)	
6	Dry	
6	Moist	
7		
8		
9	Log = 2' Dia.	
10	Blue gray, SILT, low plasticity, moist ▽	
10	Obstruction (Log?) can't break through	
11		
12		
	Bottom of test pit 12ft below ground surface	
	Drawing is NOT to scale	

SEC. 9, T.34N., R.3E., W.M.
SKAGIT COUNTY
SR 20

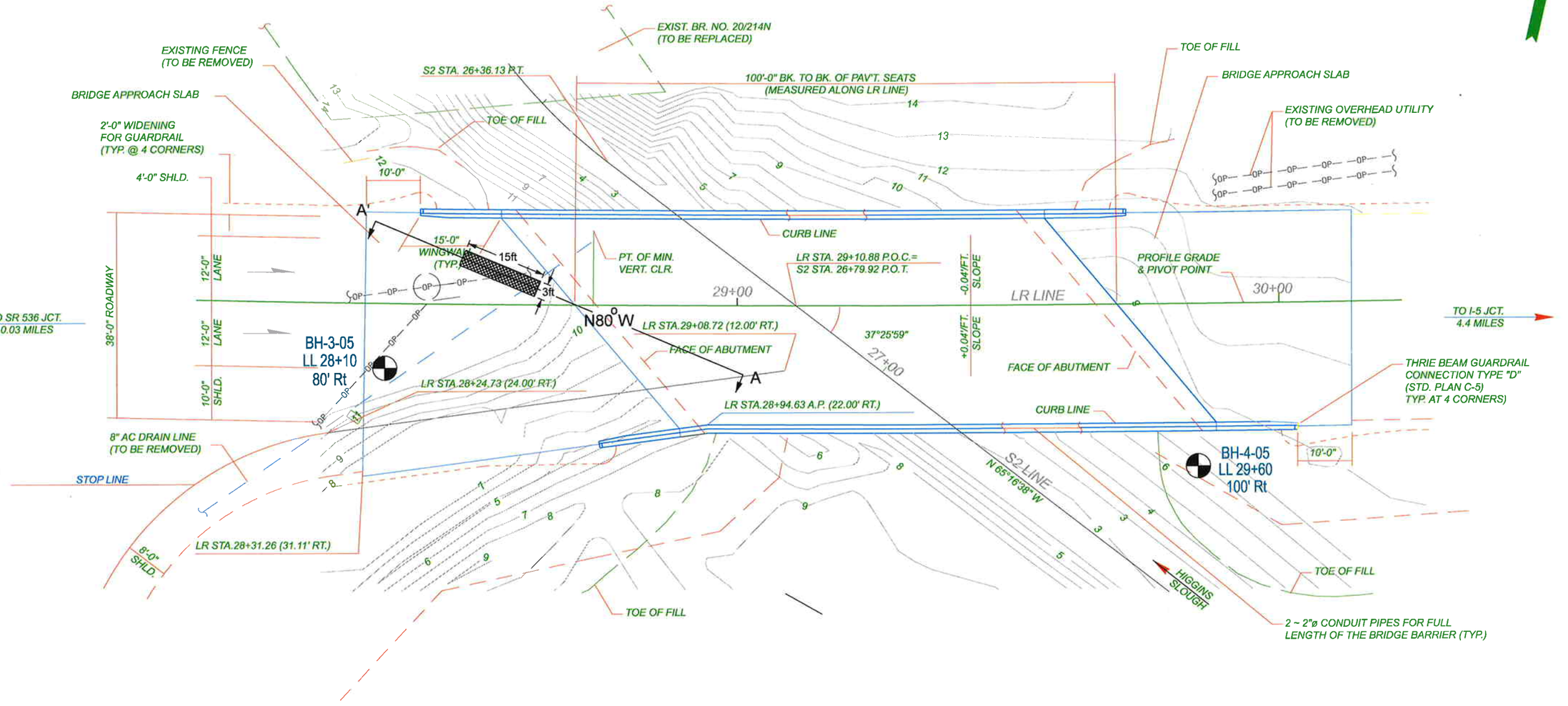

Figure 2: Test Pit Location

JOB OL-3485 S.R. 20

SR 20 Fredonia to I-5
Over Higgins Slough
Bridge #20/214S

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL DIVISION

DATE 9/2005
SCALE 1=20' VERT.
1=20' HORIZ.
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